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10/608,923	06/27/2003	Prabodh Varshney	042933/303094	7022

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EXAMINER	
HOANG, THAI D	
ART UNIT	**PAPER NUMBER**
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,923	VARSHNEY ET AL.	
	Examiner	Art Unit	
	Thai D. Hoang	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Application filed on 6/27/2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/13/04; 2/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

(i) Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

(ii) The drawings are objected to under 37 CFR 1.83(a) because they fail to show S_0 (fig. 4) as described in the specification (page 10). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

(iii) The drawings are objected to because elements in figure 1 do not have descriptive labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be

removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 20 is objected to because of the following informalities: the statement "variable leading parameter" should be changed to – variable loading parameter --. Appropriate correction is required.

Claim Rejections - 35 USC § 112

(I) The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Both specification and figure 4 (element 430) do not disclose or show "the at least one S/P converter comprises a plurality of S/P converter" as recited in the claim 6.

(ii) The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(a) Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: S/P converters (440s) and interleaver 445. The omission amounting to a gap between the elements summer 435s and OFDM modulator 450 as illustrated in figure 4.

Claims 2-13 are rejected because they depend on rejected claim 1.

(b) Claims 14-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: summing, S/P converting, and interleaving (steps 630, 635 and 640 in fig. 6). The omission amounting to a gap between the steps "spreading" and "modulating the spread streams" as illustrated in figures 4 and 6.

Claims 15-20 are rejected because they depend on rejected claim 14.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 and 9-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abeta et al., US Patent Application Publication No. 2001/0028637 A1, in view of Hosur et al, US Patent Application Publication No. 2003/0152023 A1, hereinafter referred to as Abeta and Hosur respectively.

Regarding claims 1-4, Abeta discloses a multi-carrier CDMA radio transmitting method and system. Abeta discloses the system comprising:

an encoder 12 for encoding an information stream for transmission (an encoder for encoding an information stream for transmission);

an OFDM transmitter, fig. 2 (a transmitter Operating according to an orthogonal frequency division multiplexing (OFDM) scheme), comprising:

at least one serial-to-parallel converter 13s for converting the encoded information stream to a plurality of encoded streams (at least one serial-to-parallel (S/P) converter for dividing the modulated symbol stream into a plurality of streams);

a plurality of spreading modulation part 14s for spreading each of the plurality of the encoded streams with a spreading code (a plurality of spreaders for spreading each of the plurality of streams with a spreading code);

a combiner 21 for combining the plurality of spread streams into symbol streams (at least one summer for summing the plurality of spread streams into at least one symbol stream);

an IFFT (Inverse Fast Fourier Transform) 22 for spreading symbol streams in OFDM scheme (an OFDM modulator for spreading symbol streams in the frequency domain using an inverse fast Fourier transform);

The transmitter disclosed by Abeta further comprises a transmission-rate specifying controller for controlling variable rate of the transmitter, see fig.2 and 14, abstract, paragraphs [0006], [0012]-[0029], [0112]-[0115] (wherein the transmitter applies at least one variable loading parameter.)

Abeta does not disclose the system comprises a modulator for modulating the encoded information stream. However, Hosur discloses an OFDM system comprising a modulator 16 for modulating the encoded information stream from a channel encoder 12, see fig. 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adapt the modulator disclosed by Hosur into Abeta' system in order to generate symbols of the encoded information.

Regarding claim 5, Abeta discloses the serial-to-parallel converting part 13 divides modulated symbols into a plurality of blocks, each block including a plurality of streams, see fig. 2, 4 and 5B, paragraphs [0051], [0088]-[0089] (wherein the at least one S/P converter divides the modulated symbol stream into a plurality of blocks, each block comprising a plurality of streams.)

Regarding claim 6, as best understood, Abeta discloses the system comprises a plurality of serial-to-parallel converting part 13 located in a plurality of signal generating circuits 100i, see fig. 2 (wherein the at least one S/P converter comprises, a plurality of S/P converters.)

Regarding claim 7, Abeta discloses the system comprises a plurality of combining parts 21 for combining the plurality of streams associated with at least one of the plurality of blocks, see fig. 2 (wherein the at least one summer comprises a plurality

of summers, each summer for summing the streams associated with at least one of the plurality of blocks.)

Regarding claims 9-11, Abeta discloses the system comprises channel estimation parts to estimate the status of channels and determine transmission rates, see figs. 21-24, paragraphs [0006], [0127]-[0145] (wherein the air interface has a limited transmission bandwidth and application of the variable loading parameter is a function of the bandwidth available for transmission, wherein the bandwidth available for transmission is subject to vary over time; and wherein the air interface is required to carry a varying amount of traffic and application of the variable loading parameter is a function of the current traffic load.)

Regarding claim 12, Abeta discloses that the system calculates transmission rates based on Signal-to-noise ratio, paragraph [0145] (wherein the air interface is subject to noise affecting the quality of the transmitted information and application of the variable loading parameter is a function of the noise introduced in over the air interface.)

Regarding claim 13, Abeta disclose that the system calculates transmission rates based on a distance (near/far) between BS and users, fig. 15, paragraphs [0112]-[0113] (wherein the air interface is subject to channel fading affecting the quality of the transmitted information and application of the variable loading parameter is a function of the fading state.)

Regarding claims 14 and 16-18, Abeta discloses a multi-carrier CDMA radio transmitting method and system. Abeta discloses the system comprising:

an encoder 12 for encoding an information stream for transmission (encoding the information);

an OFDM transmitter (fig. 2) comprising:

at least one serial-to-parallel converter 13s for converting the encoded information stream to a plurality of encoded streams (dividing the modulated signal into a plurality of streams);

a plurality of spreading modulation part 14s for spreading each of the plurality of the encoded streams with a spreading code (spreading each of the plurality of streams with a spreading code);

an IFFT (Inverse Fast Fourier Transform) 22 for spreading symbol streams in OFDM scheme (modulating the spread streams in an OFDM modulator);

The transmitter disclosed by Abeta further comprises a transmission-rate specifying controller for controlling variable rate of the transmitter, see fig.2 and 14, abstract, paragraphs [0006], [0012]-[0029], [0112]-[0115] (determining whether to apply a variable loading parameter.)

Abeta does not disclose the system comprises a modulator for modulating the encoded information stream. However, Hosur discloses an OFDM system comprising a modulator 16 for modulating the encoded information stream from a channel encoder 12, see fig. 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adapt the modulator disclosed by Hosur into Abeta' system in order to generate symbols of the encoded information.

Regarding claim 15, Abeta discloses a modulation level specifying part 15 determines transmission rate prior to the encoding step performed at the encoder 12, see fig. 14 (wherein the step of determining is performed prior to the encoding step.)

Regarding claim 19, does not disclose the system comprises the step of interleaving the signal prior to the modulating the spreading streams in an OFDM modulator. However, Hosur teaches an interleaver 14b interleaves encoded signal before modulating in OFDM scheme at IFFT 20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adapt the interleaver disclosed by Hosur into Abeta' system in order to protect the transmission against burst errors.

Regarding claim 20, Abeta discloses that the system calculates transmission rates based on Signal-to-noise ratio of the radio signal, paragraph [0145] (wherein application of the variable leading parameter is a function of the quality of the air interface.)

Allowable Subject Matter

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sano et al., US PG-PUB 2002/0181421 A1, "Multi-carrier CDMA communication device, multi-carrier CDMA transmitting device, and multi-carrier CDMA receiving device."

Huh et al., US PG-PUB 2005/0099939 A1, "Apparatus and method for transmitting/receiving pilot signals in an OFDM communication system."

Jalali et al., US PAT 6,952,454 B1, "Multiplexing of real time services and non-real time services for OFDM systems."

Hanada et al., US PG-PUB 2002/0054585 A1, "Transmitter, transmitting method, receiver, and receiving method for MC-CDMA communication system."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai D. Hoang whose telephone number is (571) 272-3184. The examiner can normally be reached on Monday-Friday 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571) 272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.H

Thai Hoang

CHI PHAM
SUPERVISORY PATENT EXAMINER 5/9/07